Nebraska Public Power District
Always there when you need us

NLS2006034
April 25, 2006

U.S. Nuclear Regulatory Commission
Attention: Document Control Desk
Washington, D.C. 20555-0001

Subject: Licensee Event Report No. 2006-001-00
Cooper Nuclear Station, NRC Docket 50-298, DPR-46

The purpose of this correspondence is to forward a Licensee Event Report.

Sincerely,

K. V. Chamberlain for

Stewart B. Minahan
General Manager of Plant Operations

/js

Enclosure

cc: Regional Administrator w/enclosure
USNRC - Region IV

Cooper Project Manager w/enclosure
USNRC - NRR Project Directorate IV-1

Senior Resident Inspector w/enclosure
USNRC - CNS

NPG Distribution w/enclosure

INPO Records Center w/enclosure

SORC Administrator w/enclosure

SRAB Administrator w/enclosure

CNS Records w/enclosure

COOPER NUCLEAR STATION
P.O. Box 98 / Brownville, NE 68321-0098
***Telephone:** (402) 825-3811 / **Fax:** (402) 825-5211*
www.nppd.com

IE22

Correspondence Number: NLS2006034

The following table identifies those actions committed to by Nebraska Public Power District (NPPD) in this document. Any other actions discussed in the submittal represent intended or planned actions by NPPD. They are described for information only and are not regulatory commitments. Please notify the Licensing Manager at Cooper Nuclear Station of any questions regarding this document or any associated regulatory commitments.

COMMITMENT	COMMITMENT NUMBER	COMMITTED DATE OR OUTAGE
None		

NRC FORM 366 (6-2004) U.S. NUCLEAR REGULATORY COMMISSION

APPROVED BY OMB NO. 3150-0104 EXPIRES 06/30/2007

Estimated burden per response to comply with this mandatory information collection request: 50 hrs. Reported lessons learned are incorporated into the licensing process and fed back to industry. Forward comments regarding burden estimate to the Records and FOIA/Privacy Service Branch (T-5 F52), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by internet e-mail to infocollects@nrc.gov, and to the Desk Officer, Office of Information and Regulatory Affairs NEOB-10202 (3150-0104), Office of Management and Budget, Washington, DC 20503. If a means to impose an information collection does not display a currently valid OMB control number, the NRC may not conduct or sponsor, and a person is not required to respond to, the information collection.

LICENSEE EVENT REPORT (LER)

(See reverse for required number of digits/characters for each block)

1. FACILITY NAME	2. DOCKET NUMBER	3. PAGE
Cooper Nuclear Station	05000298	1 of 4

4. TITLE
Reheat Valve Failure to Re-open Due to Contaminated Control Fluid Results in Manual Scram

5. EVENT DATE			6. LER NUMBER			7. REPORT DATE			8. OTHER FACILITIES INVOLVED	
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	MONTH	DAY	YEAR	FACILITY NAME	DOCKET NUMBER
										05000
02	26	2006	2006	- 001	00	04	25	2006	FACILITY NAME	DOCKET NUMBER 05000

9. OPERATING MODE
1

10. POWER LEVEL
070

11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check all that apply)

☐ 20.2201(b)	☐ 20.2203(a)(3)(i)	☐ 50.73(a)(2)(i)(C)	☐ 50.73(a)(2)(vii)
☐ 20.2201(d)	☐ 20.2203(a)(3)(ii)	☐ 50.73(a)(2)(ii)(A)	☐ 50.73(a)(2)(viii)(A)
☐ 20.2203(a)(1)	☐ 20.2203(a)(4)	☐ 50.73(a)(2)(ii)(B)	☐ 50.73(a)(2)(viii)(B)
☐ 20.2203(a)(2)(i)	☐ 50.36(c)(1)(i)(A)	☐ 50.73(a)(2)(iii)	☐ 50.73(a)(2)(ix)(A)
☐ 20.2203(a)(2)(ii)	☐ 50.36(c)(1)(ii)(A)	☒ 50.73(a)(2)(iv)(A)	☐ 50.73(a)(2)(x)
☐ 20.2203(a)(2)(iii)	☐ 50.36(c)(2)	☐ 50.73(a)(2)(v)(A)	☐ 73.71(a)(4)
☐ 20.2203(a)(2)(iv)	☐ 50.46(a)(3)(ii)	☐ 50.73(a)(2)(v)(B)	☐ 73.71(a)(5)
☐ 20.2203(a)(2)(v)	☐ 50.73(a)(2)(i)(A)	☐ 50.73(a)(2)(v)(C)	☐ OTHER
☐ 20.2203(a)(2)(vi)	☐ 50.73(a)(2)(i)(B)	☐ 50.73(a)(2)(v)(D)	Specify in Abstract below or in NRC Form 366A

12. LICENSEE CONTACT FOR THIS LER

FACILITY NAME	TELEPHONE NUMBER (Include Area Code)
Paul V. Fleming, Licensing Manager	(402) 825-2774

13. COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX	CAUSE	SYSTEM	COMPONENT	MANU-FACTURER	REPORTABLE TO EPIX
A	SB	ISV	S124	Y					

14. SUPPLEMENTAL REPORT EXPECTED	15. EXPECTED SUBMISSION DATE	MONTH	DAY	YEAR
☐ YES (If yes, complete EXPECTED SUBMISSION DATE). ☒ NO				

16. ABSTRACT *(Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines)*

On February 26, 2006, at 0250 Central Standard Time, Reheat Valve 1B did not re-open after the valve was closed during conduct of a surveillance test on the main turbine reheat/intercept valves. This occurred concurrent with a high level alarm in Moisture Separator D. Per procedure, the plant was manually scrammed. All control rods fully inserted and a Primary Containment Isolation System Group 2 isolation occurred. Reactor power, vessel pressure and level response were as expected.

The cause of the event was contamination of the electro-hydraulic fluid in the turbine control system from inadvertent introduction of waste fluid to the control system fluid reservoir on August 14, 2005. Feed and bleed actions to reduce the contamination did not eliminate particulate contamination in normally stagnant lines associated with the reheat/intercept test solenoid valves resulting in a stuck reheat valve.

Immediate actions were to cycle all intercept and reheat stop valves via the test solenoids several times to verify flushing of the electro-hydraulic fluid through the valves. Corrective actions to prevent recurrence include replacing the test solenoid valves for the turbine reheat/intercept and main stop valves and flushing and replacing the electro-hydraulic fluid in the turbine generator control system.

1. FACILITY NAME	2. DOCKET	6. LER NUMBER			3. PAGE
		YEAR	SEQUENTIAL NUMBER	REVISION	
Cooper Nuclear Station	05000298	2006	- 001	- 00	2 of 4

17. NARRATIVE *(If more space is required, use additional copies of Form 366A)*

PLANT STATUS

Cooper Nuclear Station (CNS) was in Mode 1 at approximately 70% power when the plant was manually scrammed. The station was at this power level to perform a control rod exchange and surveillance testing of various main turbine valves.

BACKGROUND

The power conversion systems at CNS are designed to produce electrical energy through conversion of a portion of thermal energy contained in the saturated steam supplied from the reactor, condense the turbine exhaust steam into water and return the water to the reactor as heated feedwater. The saturated steam produced by the reactor is passed through the high pressure turbine (EIIS:TRB) where the steam is expanded and then exhausted through the moisture separators (EIIS:MSR). The moisture separators reduce the moisture content of the steam to close to zero percent. The steam is then passed through the low pressure turbines where the steam is again expanded. From the low pressure turbines, the steam is exhausted into the condenser (EIIS:COND) where the steam is condensed and deaerated and then returned to the cycle as condensate.

The main turbine consists of a high pressure section and a low pressure section comprised of two turbines in tandem. Steam from the reactor is admitted to the high pressure turbine section through two main stop valve and governor valve assemblies. After expansion through the high pressure turbine section, steam flows to four moisture separators and returns to the low pressure turbine section by passing through four sets of combined intermediate valves (intercept valves and reheat stop valves combined into one assembly) (EIIS:ISV). These intermediate valves, fully open during normal operation, limit or isolate steam flow from the moisture separators to the low pressure turbines under certain conditions. This action will prevent potential damage to the low pressure turbines.

The turbine utilizes a Digital Electro-Hydraulic (DEH) (EIIS:TG) control system consisting of solid state governing devices, governor, startup control devices, emergency devices for turbine and plant protection (overspeed governor, master trip, vacuum trip, motoring protection, thrust bearing wear trip, low bearing oil pressure trip) and special control and test devices. The control system operates the main stop valves, governor valves, bypass valves, reheat stop and intercept valves and other protective devices.

EVENT DESCRIPTION

On February 25, 2006, at 2220 Central Standard Time (CST), in preparation for a control rod exchange and performance of surveillance testing of the main turbine stop valves, control valves, reheat stop valves, intercept valves and stop valve limit switches, power was lowered from 100% to approximately 90%. It was further lowered from approximately 90% to approximately 70% in accordance with the test procedure at 2324 CST.

On February 26, 2006, at 0002 CST, while performing testing on the turbine reheat/intercept valves, the 1A Reheat/Intercept valves were successfully closed and then re-opened. However, an annunciator indicating Moisture Separator C high level alarmed and then cleared. Past performance of this test procedure demonstrated that moisture separator high level alarms were a frequent occurrence when testing the opposite moisture separator's intercept and reheat valves. This appears to be a consequence

of the transient steam flow and pressure conditions caused when these valves are closed and not indicative of a persistent plant condition.

At 0007 CST, when the test button was depressed for the 1C Reheat/Intercept valves, the valves closed but the 1C Intercept Valve did not re-open when the test button was released. Troubleshooting activities for that valve then commenced. If a moisture separator high level alarm occurs concurrently with the intercept valve being closed, procedures require the plant to be manually scrammed and in-house electrical loads to be transferred. At 0048 CST, electrical loads were transferred to the Startup Transformer in the event the unit would have to be scrammed.

At 0223 CST, the 1C Intercept Valve re-opened during troubleshooting. During the period of time when this valve was closed, no moisture separator high level alarms occurred. After discussions with Engineering and station management, the plant operations staff decided that testing would continue. At 0250 CST, when the test button was depressed for the 1B Reheat/Intercept valves, the valves went closed, but when the button was released, the 1B Reheat Valve did not open and a Moisture Separator D high level alarm occurred. Per procedure, the plant was manually scrammed. All control rods fully inserted and a Primary Containment Isolation System (PCIS) Group 2 (EIIS:JM) isolation occurred. All mitigating equipment responded as expected.

BASIS FOR REPORT

This event is reportable under 10 CFR 50.73(a)(2)(iv)(A) as an event that resulted in actuation of systems listed in paragraph (a)(2)(iv)(B). Specifically, these were (a)(2)(iv)(B)(1) for Reactor Protection System actuation resulting in a reactor scram and (a)(2)(iv)(B)(2) for PCIS Group 2 Isolation. The event was reported as Event Notification number 42375.

SAFETY SIGNIFICANCE

The manual scram initiated in response to high level in a moisture separator due to a reheat valve failure to re-open was not risk significant. The event resulted in a transient with the condenser available and all mitigating equipment responding as expected. Therefore, this event resulted in a negligible change in core damage frequency and is already considered in the baseline risk modeled in the CNS Probabilistic Risk Assessment (PRA).

This event is not considered a Safety System Functional Failure as defined in NEI 99-02, Revision 4, Regulatory Assessment Performance Indicator Guideline.

CAUSE

The cause of the event was contamination of the DEH hydraulic fluid from inadvertent introduction of waste DEH fluid to the DEH reservoir that occurred on August 14, 2005. Feed and bleed actions to reduce the contamination in the reservoir below specified limits did not eliminate particulate contamination in normally stagnant hydraulic lines such as those associated with the reheat/intercept test solenoid valves. Cycling of the test valves during the two testing periods previous to this event allowed the contaminated fluid in the stagnant portions of the hydraulic lines to migrate into the proximity of the test valves. There were also contributing causes in the area of ineffective communications between the Operations and Engineering technical staffs regarding risk and procedural requirements.

1. FACILITY NAME	2. DOCKET	6. LER NUMBER			3. PAGE
		YEAR	SEQUENTIAL NUMBER	REVISION	
Cooper Nuclear Station	05000298	2006	-- 001	-- 00	4 of 4

17. NARRATIVE *(If more space is required, use additional copies of Form 366A)*

CORRECTIVE ACTION

The following corrective actions have been completed:

1. The intercept and reheat stop valves were cycled via the test solenoids. The test solenoid valves were stroked at least four times, and each time were held open for at least five seconds to verify flushing of DEH fluid through the valve.

2. The solenoid valves for main turbine 103% over-speed protection were stroked and remained open for at least one minute to verify complete flushing of DEH fluid through the valves.

The following corrective action will be taken:

1. Refocus the organization on pre-job brief activities to specify when re-performance of a pre-job brief is required, such as after a significant delay in a job, when new information is discovered about a job, when plant conditions have changed that affect a job or when new personnel become involved in a job. Due May 15, 2006.

In addition, the following corrective actions will be taken during the Cycle 23 refueling outage.

1. Replace the test solenoid valves for the turbine reheat/intercept and main stop valves.

2. Replace the servo valves for the turbine governor and bypass valves.

3. Replace the electro-hydraulic fluid in the turbine generator fluid system.

4. Perform a flush of the turbine generator fluid system.

5. Replace the emergency trip solenoid valves.

PREVIOUS EVENTS

A review of CNS LERs since 2000 was conducted. There were no reportable events similar to this event concerning a high level alarm in a moisture separator concurrent with a reheat/intercept valve failing to re-open resulting in a manual scram. There have been no significant problems due to the cleanliness of the DEH fluid in the turbine control system prior to this event. There have been no incidents of reheat or intercept valves sticking.